RESULTS OF A BALLOON ASCENSION AT ST. PETERSBURG, MAY 20/JUNE 1, 1878.[1]

By Gen. M. RYKATCHEFF.

The following are the instruments that I took with me:

1. A Richter syphon barometer.

2. A Richter aneroid, verified under the receiver of a pneumatic pump. Besides the corrections thus found the aneroid records were subjected to still further corrections relative to the retardation in the registration of the aneroid; these corrections were determined during the ascension by comparing the simultaneous records of the aneroid and of the mercurial barometer.

I had three very sensitive mercurial thermometers, with fine, long cylindrical bulbs. One of these thermometers showed every variation of temperature four times more quickly than the thermometer at the stations of the Central Physical Observatory, the other two thermometers surpassed it by from one and one-half to two times. One of these served as a wet bulb thermometer.

Poulkova mean time.	Elevations.		Differences.	Poulkova mean time.	Elevations.		Differences.
	Trigonometric.	Barometric.			Trigonometric.	Barometric.	
h. m. s.	*Meters.*	*Meters.*		*h. m. s.*	*Meters.*	*Meters.*	
2 51 21	3,776	3,914	—138	4 23 37	2,353	2,394	—41
51 48	3,817	3,925	—108	26 37	2,412	2,446	—34
56 59	3,920	4,008	— 88	27 24	2,415	2,500	—85
59 49	3,977	4,076	— 99	31 52	2,552	2,588	—36
3 1 19	4,002	4,084	— 82	35 18	2,745	2,793	—48
11 16	3,719	3,746	— 27	36 50	2,866	2,908	—42
11 49	3,650	3,726	— 76	38 44	2,999	3,045	—46
27 49	2,731	2,836	—105	46 16	3,362	3,429	—67
31 52	2,919	2,967	— 48	49 49	3,533	3,597	—64
35 44	3,155	3,216	— 61	53 39	3,742	3,782	—40
40 59	3,363	3,407	— 44	56 35	3,854	3,878	—24
45 19	3,489	3,526	— 37	59 34	3,977	3,998	—21
51 47	3,712	3,816	—104	5 6 24	4,039	4,058	—19
59 59	3,669	3,700	— 31	6 24	4,046	4,058	—12
4 6 5	3,594	3,639	— 45	6 49	4,040	4,031	+ 9
13 49	3,282	3,267	+ 15				

The thermometers and the hygrometer were placed outside of the basket on special supports. In order to protect the thermometers from radiation they were put into double boxes without bottoms or covers.

All the instruments had previously been verified and the corresponding corrections have been added to their records.

The altitudes were calculated (1) by the ordinary barometric reduction formula; (2) by the trigonometric method, sighting the balloon with theodolites from St. Petersburg (from the Central Physical Observatory and the Academy of Sciences), from Poulkova, and Cronstadt.

In all, thirty-four trigonometric determinations were made; *in thirty-one of these cases it was also possible to calculate* the elevation by the barometer.

The table given above contains, for these thirty-one cases, the hour, the trigonometric and barometric altitudes, and the differences between these values.

The mean difference deduced from the most accurate twenty-six observations is —61 meters.

The variation of the temperature with altitude may be seen in the following table:

Altitudes.	Variation of temperature for every 250 meters.	Change of elevation corresponding to a variation of 1°.
Meters.	°	*Meters.*
0—2,500	—1.5	162
2,500—2,750	—1.3	192
2,750—3,000	—1.2	208
3,000—3,250	—1.2	208
3,250—3,500	—1.2	208
3,500—3,750	—1.3	192
3,750—4,000	—2.0	125
Mean.....	—1.47	172

Results of the observations made during the ascension of May 20/June 1, 1878.

The atmospheric pressures observed with the aneroid are marked with an asterisk (*); the interpolated relative humidity is put in parenthesis.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C.			Relative humidity.	Vapor tension.	Altitude determined barometrically.
			Thermometer No. 5, corrected.	Thermometer No. 145, corrected.	Adopted temperature.			
1	2	3	4	5	6	7	8	9
	h. m. s.	*mm.*	°	°	°	%	*mm.*	*Meters.*
On ground	2 35	.....	19.9	19.5	.....	11	.....	.....
1	2 43 5	562.5*	.....	.....	+ 0.9	(88)	1.9	2,598.3
	2 43 27	.....	+ 0.9	.....	.....	.....	.....	.....
	2 43 41	.....	.....	+ 0.9	.....	.....	.....	.....
2	2 44 42	529.2*	.....	.....	— 1.2	(37)	1.5	3,087.1
	2 44 55	.....	— 1.2	.....	.....	.....	.....	.....
	2 45 9	.....	.....	— 1.7	.....	.....	.....	.....
	2 45 22	513.6	.....	.....	— 1.8	(37)	1.5	3,325.4
	2 45 36	.....	.....	.....	.....	37	.....	.....
3	2 46 17	.....	— 2.3	.....	.....	.....	.....	.....
	2 46 31	.....	.....	— 2.4	.....	.....	.....	.....
	2 46 45	508.5	.....	.....	— 2.5	(37)	1.4	3,405.1
4	2 47 27	.....	— 1.8	.....	.....	.....	.....	.....
	2 47 55	495.5	.....	.....	— 2.8	(37)	1.4	3,610.7
5	2 48 37	.....	.....	— 3.0	.....	.....	.....	.....
	2 48 47	487.9	.....	.....	— 3.0	(37)	1.3	3,733.3
6	2 49 39	.....	.....	— 3.1	.....	.....	.....	.....
	2 49 53	.....	.....	.....	.....	37	.....	.....
7	2 51 25	476.8	.....	.....	+ 1.1	(37)	1.8	3,917.5
	2 51 41	.....	.....	+ 1.1	.....	.....	.....	.....
8	2 52 18	.....	+ 1.4	.....	.....	.....	.....	.....
	2 52 32	.....	.....	+ 1.4	.....	.....	.....	.....
	2 52 46	475.3	.....	.....	+ 1.4	(37)	1.8	3,942.9
9	2 56 31	.....	.....	+ 2.0	.....	.....	.....	.....
	2 56 45	471.9	.....	.....	+ 1.7	(36)	1.8	4,001.5
10	2 57 43	.....	+ 0.4	.....	.....	.....	.....	.....
	2 58 5	.....	.....	— 0.5	.....	.....	.....	.....
	2 59 12	467.8	.....	.....	— 2.6	(36)	1.3	4,072.1
11	3 1 4	.....	.....	— 4.2	.....	.....	.....	.....
12	3 1 49	.....	.....	— 4.5	.....	.....	.....	.....
	3 1 59	.....	.....	.....	.....	36	.....	.....
	3 2 9	466.8	.....	.....	— 4.8	(36)	1.2	4,088.8
13	3 3 2	.....	.....	— 5.7	.....	.....	.....	.....
14	3 3 16	.....	.....	.....	.....	35	.....	.....
15	3 12 1	489.3*	.....	.....	— 3.6	(35)	1.2	3,718.1
	3 12 37	.....	.....	— 3.6	.....	.....	.....	.....
	3 12 47	.....	.....	.....	.....	35	.....	.....
16	3 13 13	500.5*	.....	.....	— 2.6	(36)	1.3	3,539.1
	3 13 42	.....	.....	.....	.....	36	.....	.....
	3 13 56	.....	.....	— 1.5	.....	.....	.....	.....
17	3 27 49	546.6	.....	.....	+ 1.2	(29)	1.5	2,836.0
	3 29 1	.....	.....	.....	.....	29	.....	.....
	3 29 15	.....	.....	+ 1.2	.....	.....	.....	.....
18	3 31 19	540.2	.....	.....	+ 0.9	(30)	1.5	2,929.4
	3 31 41	.....	.....	.....	.....	30	.....	.....
	3 32 26	.....	.....	+ 0.7	.....	.....	.....	.....
19	3 32 57	532.6	.....	.....	+ 0.6	(30)	1.4	3,042.4
	3 33 13	.....	.....	+ 0.5	.....	.....	.....	.....
20	3 34 8	.....	.....	+ 0.1	.....	.....	.....	.....
	3 34 46	.....	.....	.....	.....	29	.....	.....
	3 35 5	522.7	.....	.....	— 0.2	(29)	1.3	3,191.9

[1] In the Annales of the Central Meteorological Bureau of France for 1896 there is an elaborate memoir by Prof. A. Angot on the barometric formula of Laplace and the proper method of applying it to the problems of *hypsometry, especially to the calculation of the height of* a barograph carried up by a sounding balloon or kite. Angot shows that, owing to the unequal and irregular changes of temperature and moisture in the successive layers of atmosphere, it is not possible to compute the altitude as accurately as is desirable unless we carry out the computation for each individual layer and then add the results together. This computation by layers was, perhaps, not a wholly new idea, having been quite independently used by Berson and Hergesell the year before, and especially by Rykatcheff in a memoir published in 1882 in the Zapiski[2] of the Russian Geographical Society (see the Protocol of the International Aeronautic Commission, 1899, p. 127). As this method will be needed in the accurate discussion of observations made in the upper strata of the atmosphere and in the reduction of *pressure and temperature* observed at low levels upward to higher levels, the Editor, instead of attempting an unsatisfactory abstract of Rykatcheff's memoir published in Russian, has requested him to kindly communicate such instructions and tables as he deems appropriate to the solution of this problem, which will undoubtedly be one of the most important that will engage the attention of the coming generation of meteorologists. The actual results of Rykatcheff's ascension of June 1, 1878, are published herewith as communicated by him September 20/October 3, 1900, and undoubtedly present us with the first series of correlated altitudes, pressures, temperatures, humidities, and moments of observation that have been determined with the accuracy needed in the present stage of meteorology. The Editor is pleased to thus be able to make these accessible to students.—ED.

[2] Memoirs of the Imperial Russian Geographical Society, Vol. VI, No. 2, pp. 1-77, St. Petersburg, 1882.

Results of observations, etc.—Continued.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C. Thermometer No. 5, corrected.	Temperature, C. Thermometer No. 145, corrected.	Temperature, C. Adopted temperature.	Relative humidity.	Vapor tension.	Altitude determined barometrically.
1	2	3	4	5	6	7	8	9
	h. m. s.	mm.	°	°	°	%	mm.	Meters.
21	3 36 17	.....	.....	− 0.5	.....	.....	.....	.....
	3 36 33	.....	.....	.....	.....	29	.....	.....
22	3 36 50	518.4	.....	.....	− 0.8	(29)	1.3	3,257.4
	3 37 22	516.4	.....	.....	− 0.2	(29)	1.3	3,287.9
	3 38 8	.....	0.0	.....	.....	.....	.....	.....
	3 38 22	.....	.....	.....	.....	29	.....	.....
	3 38 36	.....	.....	− 0.4	.....	.....	.....	.....
	3 38 51	514.8	.....	.....	− 0.5	(29)	1.2	3,312.5
23	3 41 9	508.2	.....	.....	− 1.0	(29)	1.3	3,414.4
	3 41 39	.....	.....	− 1.1	.....	.....	.....	.....
	3 41 49	.....	.....	.....	.....	28.5	.....	.....
24	3 41 59	506.2	.....	.....	− 1.3	(29)	1.2	3,445.4
	3 43 22	.....	.....	.....	.....	28.5	.....	.....
	3 43 26	.....	.....	− 2.4	.....	.....	.....	.....
	3 44 4	503.7	.....	.....	− 1.6	(29)	1.2	3,484.0
	3 44 24	.....	.....	− 1.2	.....	.....	.....	.....
	3 45 1	.....	.....	.....	.....	28.5	.....	.....
25	3 45 48	.....	− 0.7	.....	.....	.....	.....	.....
26	3 48 26	494.5	.....	.....	+ 0.1	(29)	1.3	3,629.4
	3 48 50	.....	.....	+ 0.2	.....	.....	.....	.....
27	3 49 45	.....	.....	− 0.5	.....	.....	.....	.....
	3 50 23	.....	.....	− 1.7	.....	.....	.....	.....
	3 50 52	486.9	.....	.....	− 1.7	(29)	1.2	3,752.2
	3 51 21	.....	.....	.....	.....	28.5	.....	.....
28	3 52 3	481.8	.....	.....	− 1.5	(29)	1.2	3,835.4
	3 52 47	.....	.....	− 1.5	.....	.....	.....	.....
	3 53 1	.....	.....	.....	.....	28.5	.....	.....
29	3 54 43	479.5	.....	.....	− 3.7	(28)	1.0	3,873.1
30	3 57 40	.....	.....	− 5.5	.....	.....	.....	.....
	3 57 57	484.4	.....	.....	− 5.5	(28)	0.9	3,790.4
31	3 58 28	.....	.....	− 5.6	.....	.....	.....	.....
	3 58 43	.....	.....	.....	.....	28	.....	.....
32	3 59 59	490.0	.....	.....	− 5.5	(28)	0.9	3,699.9
	4 0 42	.....	.....	.....	.....	29	.....	.....
33	4 7 23	.....	.....	− 5.0	.....	.....	.....	.....
	4 7 52	.....	.....	.....	.....	28.5	.....	.....
34	4 8 6	495.0	.....	.....	− 4.6	(28)	0.9	3,618.8
	4 9 3	.....	.....	− 4.0	.....	.....	.....	.....
35	4 11 13	.....	.....	− 3.2	.....	.....	.....	.....
	4 11 42	507.7	.....	.....	− 3.1	(28)	1.0	3,415.0
36	4 12 23	.....	.....	− 3.0	.....	.....	.....	.....
	4 12 39	.....	.....	.....	.....	28.5	.....	.....
	4 12 52	511.0	.....	.....	− 3.8	(28)	1.0	3,364.0
37	4 13 19	.....	.....	− 4.1	.....	.....	.....	.....
	4 13 34	.....	.....	.....	.....	28	.....	.....
38	4 13 49	518.1*	.....	.....	− 3.8	(28)	1.0	3,266.9
	4 14 4	.....	.....	− 3.7	.....	.....	.....	.....
39	4 14 34	533.1*	.....	.....	− 3.1	(28)	1.0	3,040.6
	4 14 48	.....	.....	− 3.0	.....	.....	.....	.....
40	4 16 19	543.3*	.....	.....	− 0.5	(28)	1.2	2,889.0
	4 16 33	.....	.....	− 0.5	.....	.....	.....	.....
41	4 17 59	548.4*	.....	.....	+ 0.5	(28)	1.3	2,813.4
	4 18 9	.....	+ 0.5	.....	.....	.....	.....	.....
	4 18 19	.....	.....	+ 1.0	.....	.....	.....	.....
42	4 18 53	.....	.....	+ 1.5	.....	.....	.....	.....
43	4 19 35	558.4*	.....	.....	+ 2.1	(28)	1.6	2,667.2
	4 19 42	.....	.....	+ 2.2	.....	.....	.....	.....
	4 19 48	.....	.....	.....	.....	28.5	.....	.....
44	4 20 7	568.5*	.....	.....	+ 2.2	(28)	1.6	2,522.2
	4 20 20	.....	.....	+ 2.2	.....	.....	.....	.....
45	4 21 15	.....	.....	+ 2.8	.....	.....	.....	.....
46	4 22 41	578.6*	.....	.....	+ 2.5	(28)	1.6	2,378.6
	4 22 55	.....	.....	+ 2.5	.....	.....	.....	.....
	4 23 9	.....	.....	.....	.....	28	.....	.....
47	4 27 53	.....	.....	+ 1.2	.....	.....	.....	.....
	4 28 22	.....	.....	.....	.....	27	.....	.....
48	4 30 41	568.5	.....	.....	+ 2.4	(27)	1.5	2,514.2
	4 30 55	.....	.....	+ 2.5	.....	.....	.....	.....
	4 31 10	565.4	.....	.....	+ 2.6	(27)	1.5	2,558.8
49	4 32 11	.....	.....	+ 3.0	.....	.....	.....	.....
	4 32 30	.....	.....	.....	.....	26	.....	.....
50	4 32 40	560.1	.....	.....	+ 2.7	(26)	1.5	2,621.3
	4 33 28	.....	.....	+ 2.1	.....	.....	.....	.....
	4 33 42	.....	.....	.....	.....	26	.....	.....
	4 33 57	556.5	.....	.....	+ 2.0	(26)	1.5	2,612.3
51	4 35 56	544.3	.....	.....	+ 1.3	(26)	1.3	2,849.3
	4 36 9	.....	.....	.....	.....	26	.....	.....
52	4 36 59	.....	.....	+ 0.7	.....	.....	.....	.....
	4 37 12	538.7	.....	.....	+ 0.8	(26)	1.3	2,931.3
53	4 37 39	536.9*	.....	.....	+ 1.1	(26)	1.3	2,957.7
	4 37 53	.....	.....	+ 1.2	.....	.....	.....	.....
54	4 38 54	.....	.....	− 0.4	.....	.....	.....	.....
	4 39 4	.....	+ 0.2	.....	.....	.....	.....	.....
55	4 39 40	526.1*	.....	.....	− 0.8	(25)	1.1	3,119.3
	4 40 7	.....	.....	− 1.0	.....	.....	.....	.....
	4 40 33	.....	.....	.....	.....	25	.....	.....
	4 40 59	.....	− 0.9	.....	.....	.....	.....	.....
	4 41 6	.....	.....	− 1.2	.....	.....	.....	.....
56	4 42 21	.....	.....	− 0.7	.....	.....	.....	.....
	4 42 36	.....	− 0.5	.....	.....	.....	.....	.....
	4 42 51	.....	.....	.....	.....	25	.....	.....
57	4 43 20	514.8*	.....	.....	+ 0.2	(25)	1.1	3,290.0
	4 43 35	.....	.....	+ 0.5	.....	.....	.....	.....
	4 43 50	.....	.....	.....	.....	25	.....	.....
	4 44 5	510.0	.....	.....	+ 0.5	(25)	1.2	3,358.2

Results of observations, etc.—Continued.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C. Thermometer No. 5, corrected.	Temperature, C. Thermometer No. 145, corrected.	Temperature, C. Adopted temperature.	Relative humidity.	Vapor tension.	Altitude determined barometrically.
1	2	3	4	5	6	7	8	9
	h. m. s.	mm.	°	°	°	%	mm.	meters.
57	4 44 20	.....	.....	+ 0.5	.....	.....	.....	.....
	4 44 50	509.0	.....	.....	− 0.1	(25)	1.1	3,379.7
	4 45 4	.....	.....	.....	.....	25	.....	.....
	4 45 34	.....	.....	− 0.9	.....	.....	.....	.....
58	4 46 4	.....	− 1.1	.....	.....	.....	.....	.....
59	4 46 35	505.1*	.....	.....	− 1.2	(25)	1.1	3,439.8
	4 46 50	.....	.....	− 1.2	.....	.....	.....	.....
	4 47 6	.....	− 1.5	.....	.....	.....	.....	.....
	4 47 21	.....	.....	.....	.....	25	.....	.....
	4 47 52	.....	.....	− 2.2	.....	(25)	.....	.....
	4 48 8	.....	− 1.9	.....	.....	25	.....	.....
	4 48 23	499.9	.....	.....	− 2.2	(25)	1.0	3,520.9
	4 48 39	.....	.....	.....	.....	25	.....	.....
60	4 49 31	.....	.....	− 2.2	.....	.....	.....	.....
61	4 50 6	.....	.....	− 3.1	.....	.....	.....	.....
	4 50 22	.....	− 2.9	.....	.....	.....	.....	.....
	4 50 31	492.7	.....	.....	− 3.1	(25)	0.9	3,694.3
62	4 50 59	.....	.....	− 3.0	.....	.....	.....	.....
	4 51 9	.....	− 3.1	.....	.....	.....	.....	.....
	4 51 19	.....	.....	.....	.....	25	.....	.....
	4 51 29	490.7	.....	.....	− 3.3	(25)	0.9	3,665.6
63	4 52 3	.....	.....	− 3.6	.....	.....	.....	.....
	4 52 14	.....	− 3.5	.....	.....	.....	.....	.....
	4 52 26	.....	.....	.....	.....	25	.....	.....
	4 52 38	487.7	.....	.....	− 2.9	(25)	0.9	3,713.4
64	4 53 14	.....	.....	− 2.2	.....	.....	.....	.....
	4 53 27	.....	− 1.4	.....	− 2.9	.....	.....	.....
65	4 53 59	482.1	.....	.....	− 2.1	(25)	1.0	3,803.9
	4 54 18	.....	.....	− 2.0	.....	.....	.....	.....
66	4 54 58	478.4*	.....	.....	− 2.8	(25)	0.9	3,864.4
	4 55 19	.....	.....	− 2.8	.....	.....	.....	.....
67	4 55 54	479.1*	.....	.....	− 2.8	(25)	0.9	3,852.1
	4 56 8	.....	.....	− 2.8	.....	.....	.....	.....
68	4 56 38	477.4*	.....	.....	− 2.9	(25)	0.9	3,879.9
	4 56 53	.....	.....	− 3.0	.....	.....	.....	.....
69	4 57 53	475.4*	.....	.....	− 3.1	(25)	0.9	3,912.2
	4 58 7	.....	.....	− 3.2	.....	.....	.....	.....
	4 58 20	.....	− 3.1	.....	.....	.....	.....	.....
70	4 58 49	473.1*	.....	.....	− 3.5	(25)	0.9	3,949.9
	4 59 4	.....	.....	− 3.6	.....	.....	.....	.....
71	4 59 49	469.3*	.....	.....	− 4.6	(25)	0.8	4,015.2
	5 0 3	.....	.....	− 4.6	.....	.....	.....	.....
72	5 6 34	467.3*	.....	.....	− 8.0	(25)	0.6	4,046.5
	5 6 42	.....	.....	− 8.0	.....	.....	.....	.....
73	5 6 58	468.9*	.....	.....	− 8.0	(25)	0.6	4,019.9
	5 7 6	.....	.....	− 8.0	.....	.....	.....	.....
74	5 7 23	469.8*	.....	.....	− 8.0	(25)	0.6	4,005.0
	5 7 30	.....	.....	− 8.0	.....	.....	.....	.....
75	5 33 4	.....	.....	− 0.5	.....	.....	.....	.....
76	5 33 29	539 5	.....	.....	.....	.....	.....	2,911.6
77	5 34 4	531.1*	.....	.....	0.0	(26)	1.2	2,948.8
	5 34 29	.....	.....	+ 0.2	.....	.....	.....	.....
78	5 35 39	.....	.....	− 0.5	.....	.....	.....	.....
79	5 35 59	.....	.....	− 0.5	.....	.....	.....	.....
80	5 36 18	554.8*	.....	.....	+ 0.5	(26)	1.8	2,686.8
	5 36 26	.....	.....	+ 1.0	.....	.....	.....	.....
81	5 36 56	562.3*	.....	.....	+ 0.9	(26)	1.3	2,579.0
	5 37 18	.....	.....	+ 0.8	.....	.....	.....	.....
82	5 38 3	.....	.....	+ 1.2	.....	.....	.....	.....
83	5 38 54	567.9*	.....	.....	+ 1.0	(26)	1.2	2,499.2
	5 39 8	.....	.....	+ 1.0	.....	.....	.....	.....
84	5 43 4	576.9*	.....	.....	+ 2.3	(26)	1.5	2,372.2
	5 43 18	.....	.....	+ 2.3	.....	.....	.....	.....
	5 43 33	.....	.....	.....	.....	26	.....	.....
85	5 46 14	571.9*	.....	.....	+ 2.3	(27)	1.5	2,442.2
	5 46 28	.....	.....	+ 2.3	.....	.....	.....	.....
	5 46 43	.....	.....	.....	.....	27	.....	.....
86	5 49 42	.....	.....	+ 1.5	.....	.....	.....	.....
	5 50 27	.....	.....	.....	.....	26	.....	.....
87	5 51 4	579.0*	.....	.....	+ 1.2	(26)	1.3	2,342.4
	5 51 18	.....	.....	+ 1.2	.....	.....	.....	.....
88	5 55 41	576.9*	.....	.....	+ 1.7	(26)	1.4	2,371.5
	5 56 3	.....	.....	+ 1.7	.....	.....	.....	.....
	5 56 25	.....	.....	.....	.....	25.5	.....	.....
89	5 57 24	576.9*	.....	.....	+ 0.9	(25)	1.2	2,371.0
	5 57 38	.....	.....	+ 1.0	.....	.....	.....	.....
90	5 59 24	587.0*	.....	.....	+ 0.7	(26)	1.2	2,231.5
	5 59 38	.....	.....	+ 0.7	.....	.....	.....	.....
91	6 1 34	604.0*	.....	.....	+ 0.7	(27)	1.3	2,002.1
	6 1 48	.....	.....	+ 0.7	.....	.....	.....	.....
92	6 12 4	667.0	.....	.....	+ 8.0	(35)	2.8	1,192.0
	6 12 18	.....	.....	+ 8.0	.....	.....	.....	.....
	6 12 33	.....	.....	.....	.....	(38)	.....	.....
93	6 18 24	687.0	.....	.....	+ 9.5	(38)	3.6	946.5
94	6 14 28	692.0*	.....	.....	+11.0	(38)	3.7	885.0
	6 14 42	.....	.....	+11.0	.....	.....	.....	.....

THE GULF STREAM MYTH.

By HARVEY MAITLAND WATTS.

There are few things more curious to-day than the defer-